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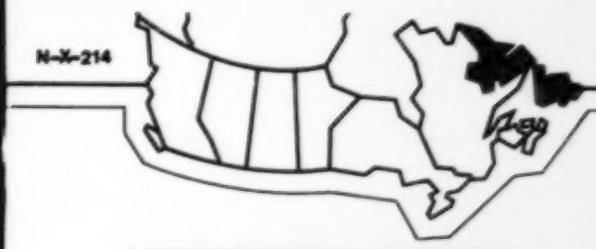
NEWFOUNDLAND FOREST RESEARCH CENTRE
INFORMATION REPORT N-X

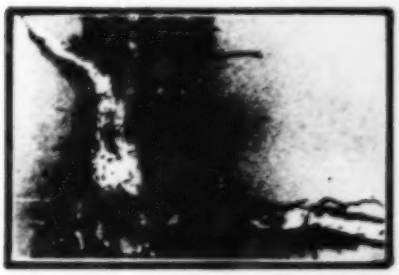
Forest Insect and Disease Conditions

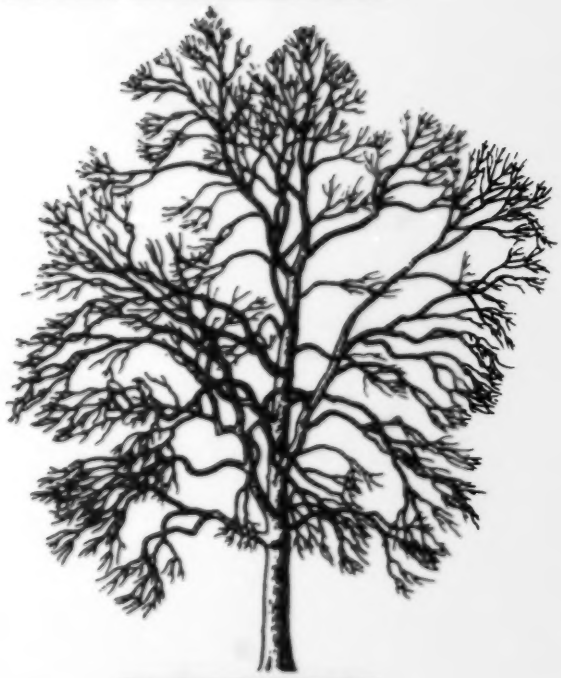
Newfoundland & Labrador 1982

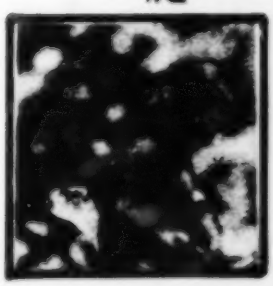
L.J. Clarke and G.C. Carew
Newfoundland Forest Research Centre
St. John's, Newfoundland

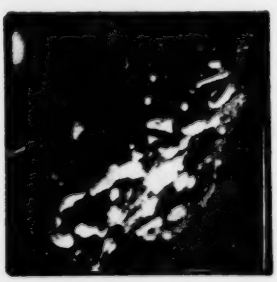
N-X-214











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Cover Photographs

Armillaria Root Rot

Spruce Budworm

Shoot and Leaf Blight

Birch Casebearer

FOREST INSECT AND DISEASE CONDITIONS IN NEWFOUNDLAND AND LABRADOR - 1982

by: L.J. Clarke and G.C. Carew

INFORMATION REPORT N-X-214
1983

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CANADIAN FORESTRY SERVICE
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ABSTRACT

This report summarizes forest pest conditions in Newfoundland and Labrador in 1982 and was compiled from information collected in 12 Forest Insect and Disease Survey Districts. Major pests of fir, spruce, pine and larch forests and deciduous tree species are discussed in detail and pests of lesser importance are tabulated.

RÉSUMÉ

Ce rapport est un résumé de la situation des ravageurs forestiers à Terre-Neuve et au Labrador en 1982. Les renseignements qu'il contient proviennent du relevé des insectes et des maladies des arbres effectué dans 12 districts. Les ravageurs des forêts de sapin, d'épinette, de pin et de mélèze et ceux des espèces feuillues font l'objet d'un exposé détaillé et les ravageurs de moindre importance sont présentés sous forme de tableau.

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INTRODUCTION

This report summarizes forest insect and disease conditions in the forests of Newfoundland and Labrador for 1982 and provides a forecast of conditions in 1983. The region is divided into 12 ranger districts with four district rangers responsible for detecting, monitoring and collecting forest pests, maintaining records and surveys to support forest research and providing advisory services on forest insect and disease conditions to governments, industry and the general public. The information in this report was compiled from the observations and field records of the district rangers and other survey personnel. The Forest Insect and Disease Survey Districts and the Provincial Forest Management Units are included for reference (Figs. 1 and 2). A more detailed report is on file at the Newfoundland Forest Research Centre.

SUMMARY

The most destructive insects in the Province in 1982 were the spruce budworm, spruce beetle and larch sawfly. The balsam woolly aphid, blackheaded budworm and hemlock looper also increased and caused some defoliation of forest stands. The birch casebearer and mountain-ash sawfly were the most important insects on hardwoods. The eyespotted budmoth was found for the first time in the Province in 1982.

Scleroderris canker continued to cause mortality of pine trees on the Avalon Peninsula. Armillaria root rot caused severe damage to dying black spruce stands in central and eastern Newfoundland. Witches' broom of black spruce, inland spruce cone rust, broom rusts of conifers and needle rusts also increased in different areas of the Island and caused some damage. Black knot of pin cherry and shoot and leaf blight of aspen were more common than usual and caused severe damage of the host trees. Winter drying caused the most widespread non-infectious damage affecting pines, spruce and fir. Larch canker was found for the first time at a few locations on the Island.

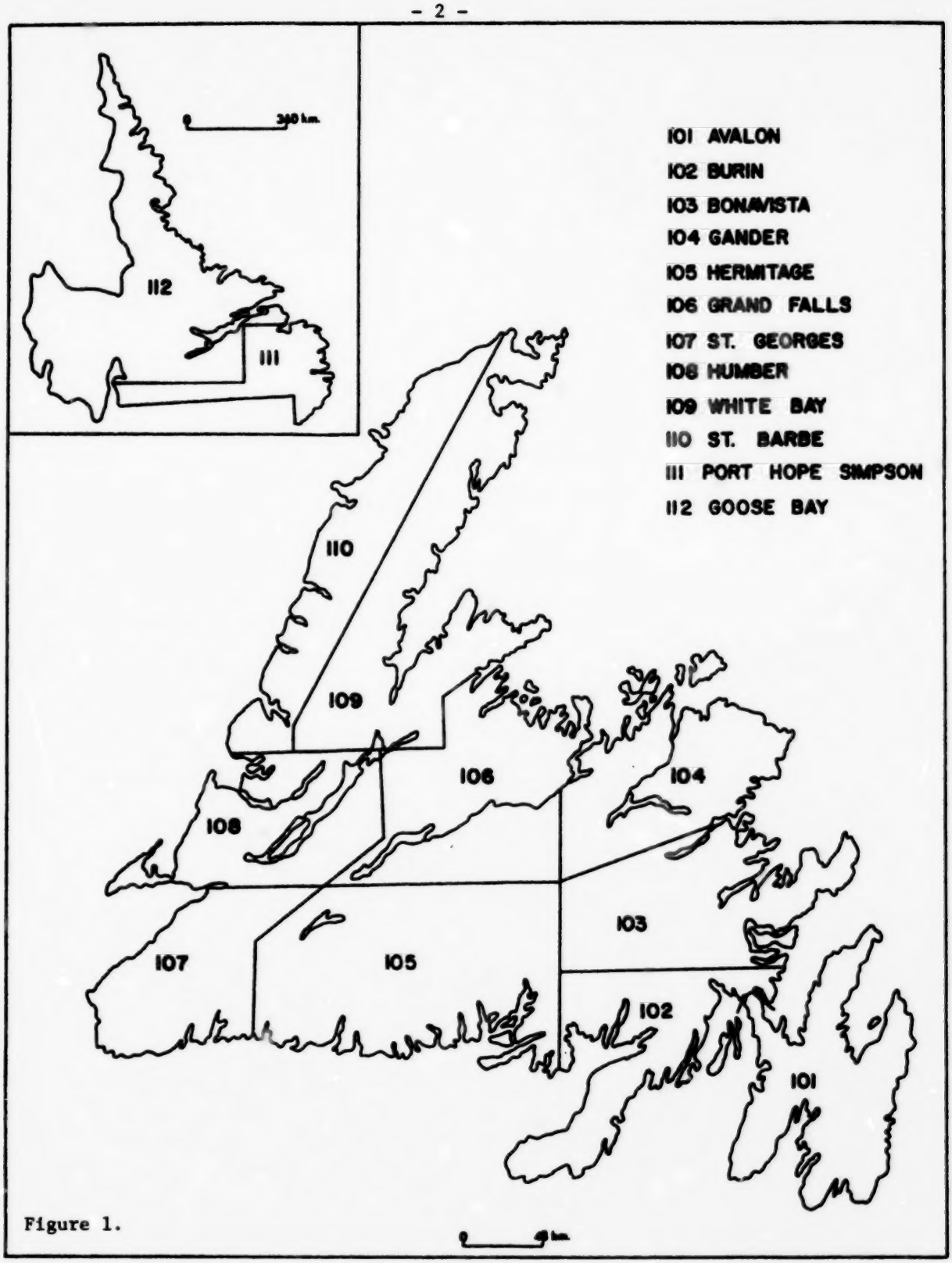

Figure 1.

Forest Insect and Disease Survey Districts.

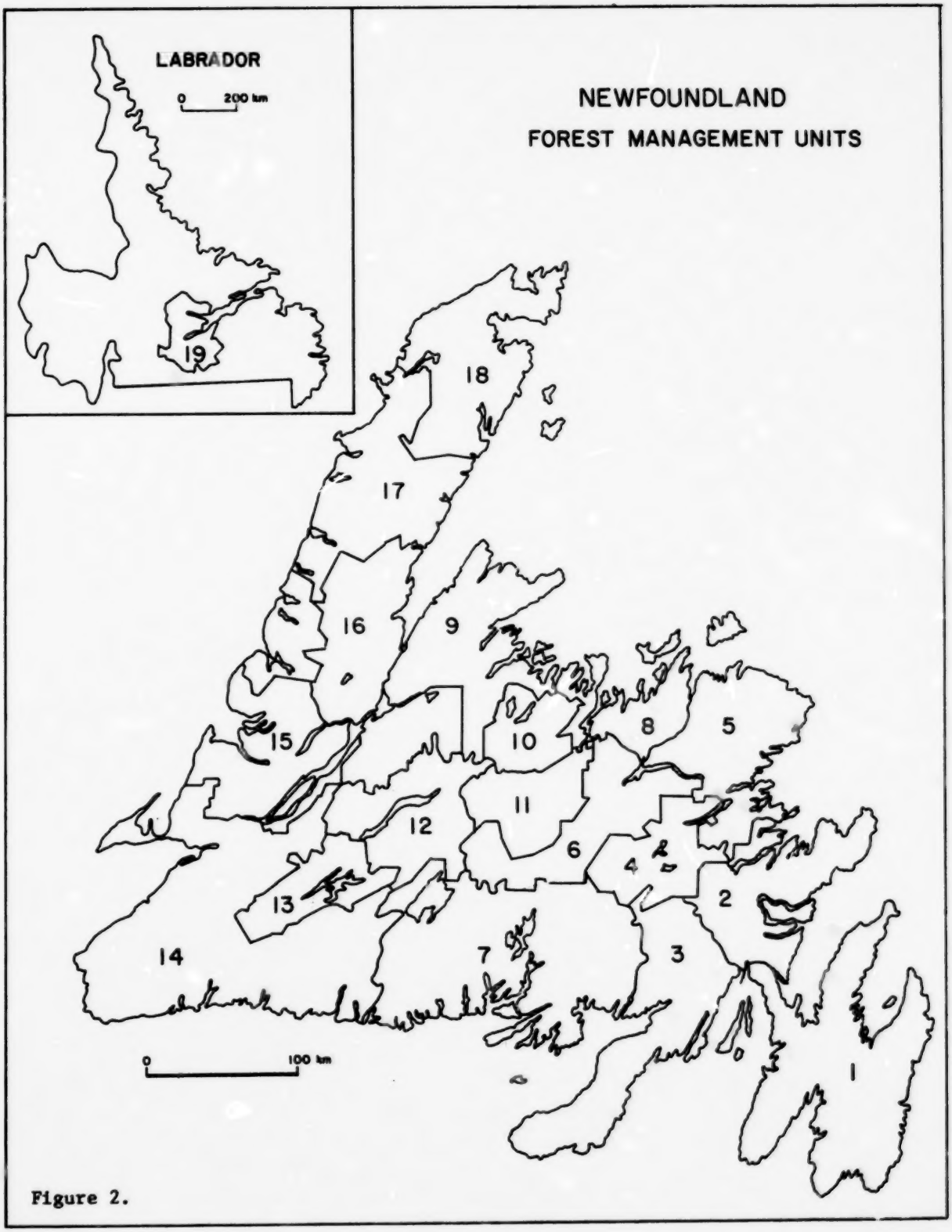
LABRADOR
0 200 km
19
NEWFOUNDLAND
FOREST MANAGEMENT UNITS
18
17
16
9
15
10
8
5
11
12
6
4
2
13
14
7
3
1
0 100 km

Figure 2.

SPRUCE AND FIR PESTS

Spruce Budworm, Choristoneura fumiferana (Clem.) — The area of light, moderate and severe budworm defoliation on the Island was about 90 000 ha in 1982 (Table 1, Fig. 3), a major decrease from the 400 000 ha in 1981. The area of moderate and severe defoliation totalled about 41 000 ha, also a significant decrease from the 380 000 ha recorded in 1981. The moderate and severe defoliation was distributed in several areas from St. Andrews to Deer Lake and in a small area on the Baie Verte Peninsula in western Newfoundland and along the Noel Paul's Brook in central Newfoundland (Fig. 3). In Labrador, two small infestations were active in mature balsam fir and spruce stands near Goose Point and along the Beaver River near Goose Bay. Moderate and severe defoliation occurred in about 700 ha (Table 1, Fig. 3).

During the week of July 4-10 an invasion of spruce budworm moths occurred throughout western and central Newfoundland. Pheromone traps distributed from Port aux Basques to Hawkes Bay and east to Bishops Falls all had catches of budworm moths. These moths were evidently transported to the Island on warm air currents from the Maritime Provinces or Quebec as the local budworm population on the Island during this period was only in the developing larval or prepupal stages.

Results of samples of spruce budworm collected throughout the districts and reared in the laboratory showed that about 11% of the budworm population was parasitized. The major parasites were Apanteles fumiferanae (Vier.) and Glypta fumiferana (Vier.) and the most important pupal parasites were Phaeogenes hariolus (Cress.) and Ephilates ontario (Cress.). Fungal disease caused about 12% mortality of the reared budworm samples. The major fungal pathogen was Zoophthora radicans (Brefeld). The incidence of microsporidian disease caused by Nosema fumiferana (Thom.) was about 2%.

The Provincial Department of Forest Resources and Lands treated about 43 000 ha of forest stands with Matacil® and 4 800 ha with Bacillus thuringiensis (Berliner), to reduce spruce budworm damage.

The damage assessment survey in previous years was conducted by Canadian Forestry Service personnel assisted by provincial forestry technicians, in all productive young and merchantable stands where tree mortality had occurred. The areas of these stands were delineated on 1:250,000 scale map sheets and the volumes determined using the most recent inventory figures. This method showed that in 1981 the cumul-

Table 1. Area (ha) of defoliation caused by the spruce budworm in productive forests of Newfoundland in 1982.

Management unit no.	Defoliation class[1]			
	Light	Moderate	Severe	Total
9	864	-	207	1071
12	2827	-	843	3670
14	35297	2914	17989	56200
15	10208	1222	17985	29415
19	-	-	660	660
Total Island	49196	4136	37024	90356
Total Labrador	-	-	660	660

[1] Light 1% to 25%
Moderate 26% to 75%
Severe 76% to 100%

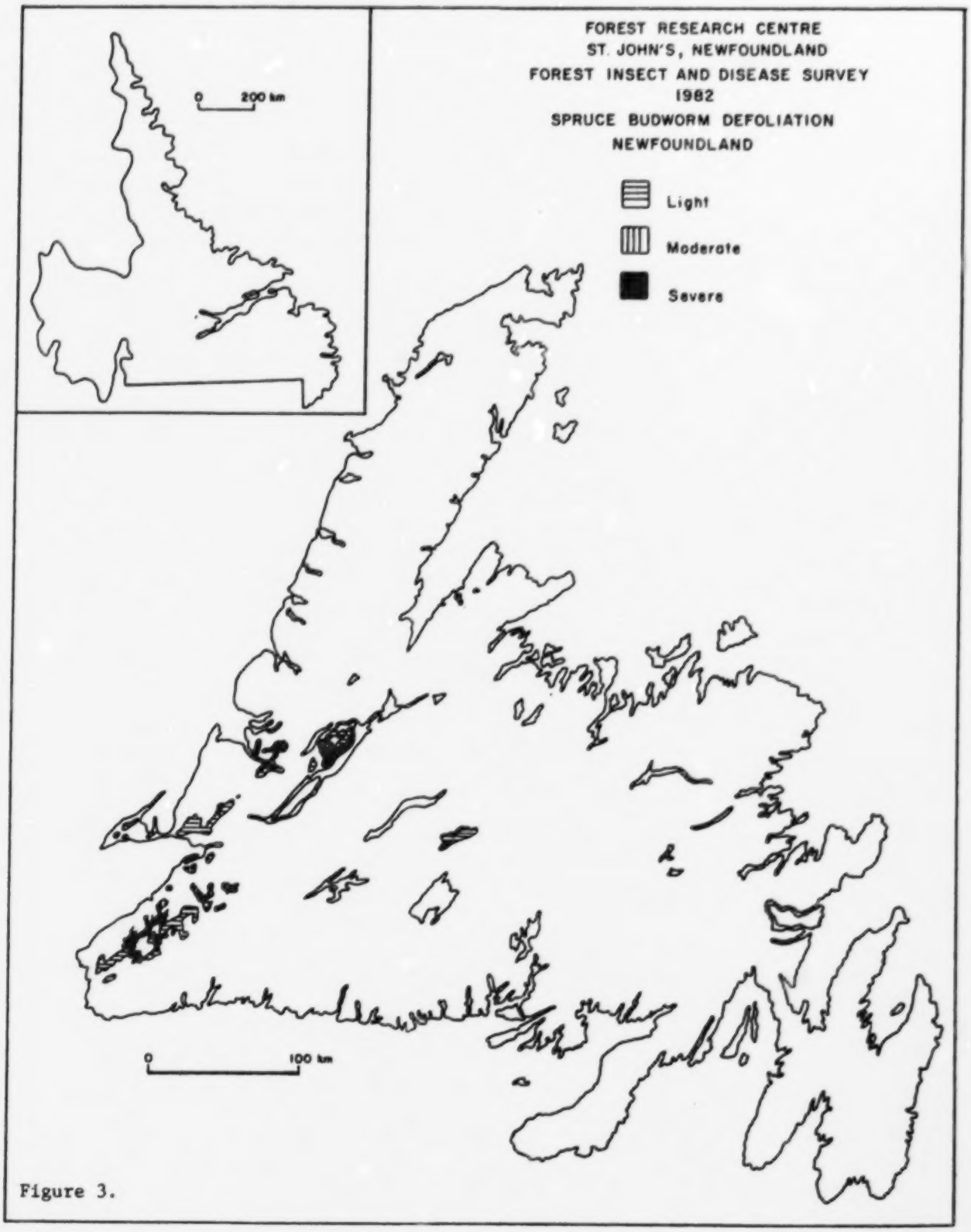
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1982
SPRUCE BUDWORM DEFOLIATION
NEWFOUNDLAND
Light
Moderate
Severe
0 200 km
0 100 km

Figure 3.

ative area of merchantable stands with tree mortality was about 427 500 ha with a total volume of about 40 000 000 m^3 and a dead volume of about 18 450 000 m^3. Beginning in 1982 in cooperation with the Inventory Section of the Provincial Department of Forest Resources and Lands, the damage assessment survey was intensified and a two year transition period was initiated to produce damage maps at the 1:30,000 scale and to transfer this detailed damage assessment to the Inventory Section.

The comprehensive analysis of data from the 1982 damage survey has not been completed but preliminary results indicate that the area of merchantable balsam fir stands containing tree mortality did not increase appreciably with the exception of an estimated 1 300 ha increase in the Gander Bay area (Fig. 4). However, the proportion of tree mortality increased from last year and the total volume of dead trees in balsam fir stands in 1982 reached about 20 000 000 m^3.

The deterioration of trees and a large increase in mortality in several major black spruce stands was recorded in central and eastern Newfoundland in 1982. These stands had been severely damaged by the spruce budworm but most of them had shown recovery during the past two years following the decline of the budworm populations. The most extensive and severe tree mortality occurred in the Northwest Gander River area, in the South Brook Valley near Halls Bay, and north of Twin Lakes (Fig. 5). Several areas of lesser damage occurred from Red Indian Lake to Deer Pond and from Halls Bay to Gander Bay. Ground checks and preliminary surveys showed that the four-eyed spruce bark beetle, Polygraphus rufipennis (Kby.) and Armillaria root rot, Armillaria mellea (Vahl. ex Fr.) Kummer are present in these stands and are hastening tree mortality. Both of these pests are native to the Island although no previous widespread, severe damage had been recorded. It is difficult to predict exactly the further development of the present damage but the unprecedented severity of budworm defoliation in most of the black spruce stands apparently favours the sudden buildup of these usually secondary pests. Other unknown factors may also play a role in the general, rapid deterioration of stand condition.

The actual area of predominately black spruce stands affected was 80 500 ha with a total stand volume of 8 233 000 m^3 (Fig. 5).

Egg-mass surveys were conducted in over 800 sample points across the Island and in 20 points in Labrador. Based on this survey, the area of moderate and severe defoliation on the Island in 1983 is forecast to be about 110 000 ha distributed from South Branch to Deer Lake in western Newfoundland and in a small area along the Noel Paul's

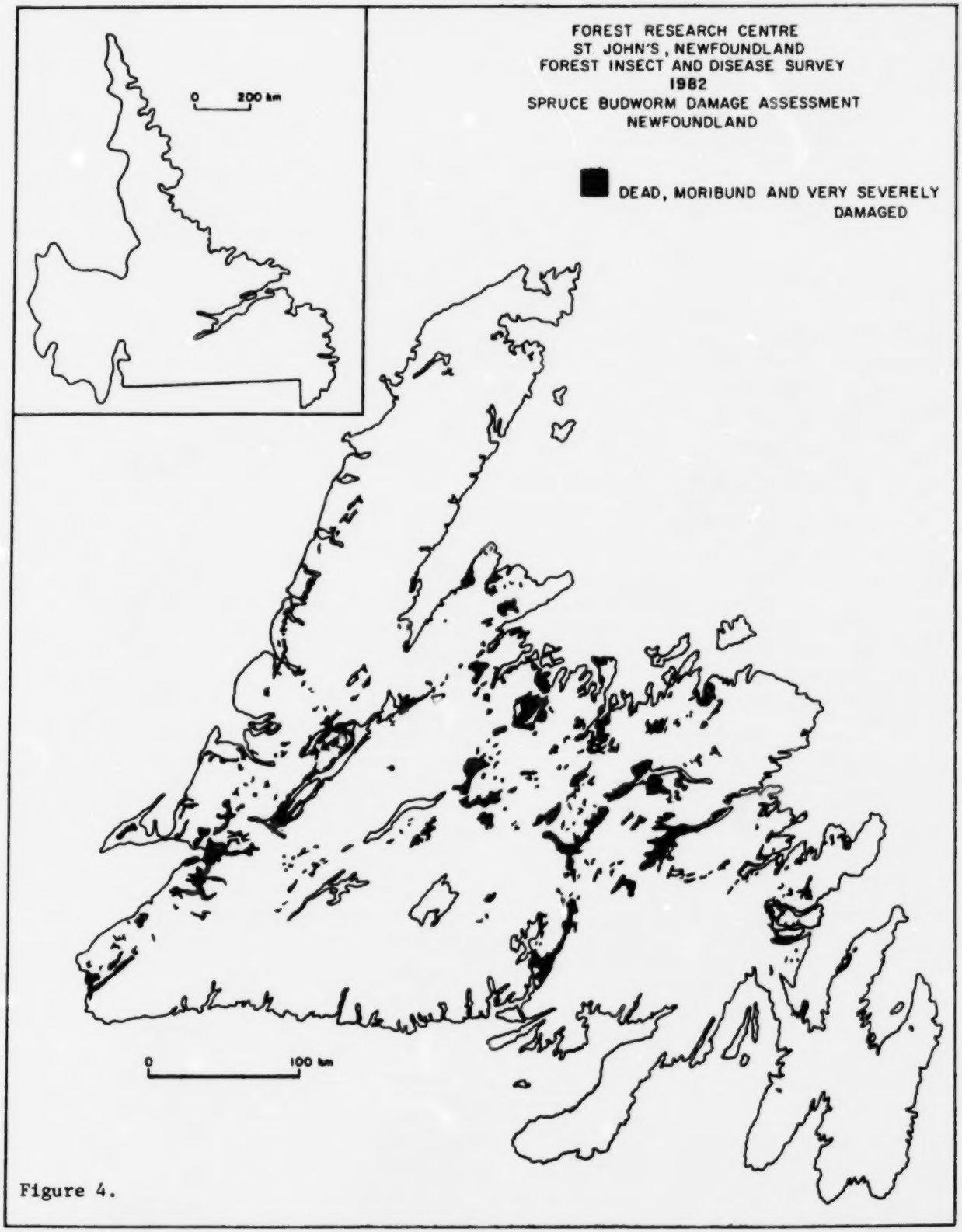
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1982
SPRUCE BUDWORM DAMAGE ASSESSMENT
NEWFOUNDLAND
DEAD, MORIBUND AND VERY SEVERELY DAMAGED
0 200 km
0 100 km

Figure 4.

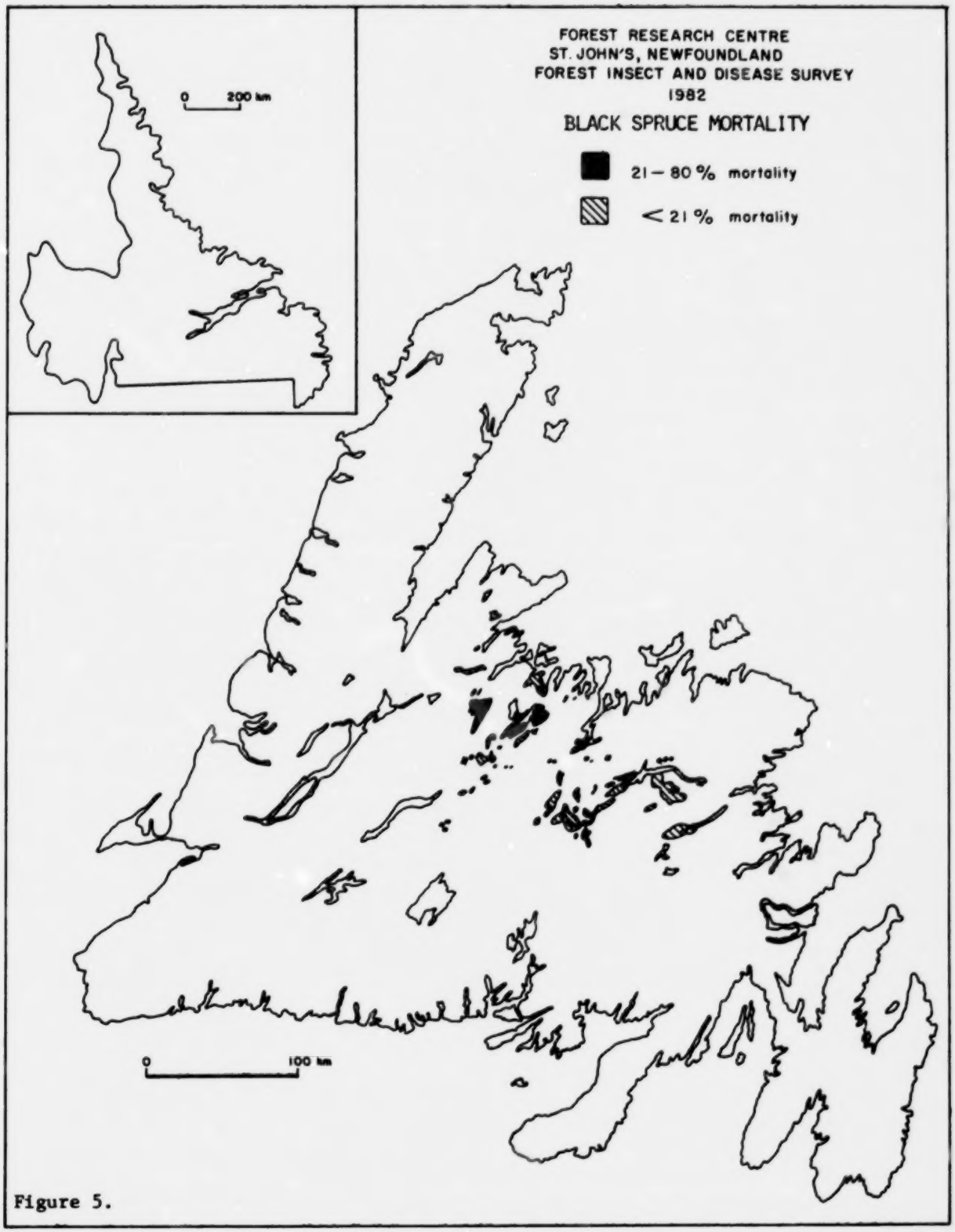
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1982
BLACK SPRUCE MORTALITY
21 – 80 % mortality
< 21 % mortality
0 200 km
0 100 km

Figure 5.

Brook in central Newfoundland (Table 2, Fig. 6). Light defoliation is forecast in about 102 000 ha distributed in isolated patches from the Codroy Valley to Roddickton and east to the Avalon Peninsula (Fig. 6). Based on tree conditions and expected defoliation, the area of moderate and high hazard is forecast to be about 165 000 ha in 1983 (Table 2, Fig. 7).

In Labrador, moderate and severe defoliation is forecast to occur in about 1 000 ha near Beaver River (Table 2, Fig. 6). Light defoliation is expected in about 100 ha near Goose Point. The area of moderate and high hazard is forecast to be approximately 1 000 ha (Table 2, Fig. 7).

Population levels indicated by the number of egg masses per 10 m^2 of foliage are expected to be about 147 in the moderate defoliation category and 379 in the severe (Table 3).

Eastern Hemlock Looper, Lambdina fiscellaria fiscellaria (Guen.) – Light defoliation by this insect was recorded in a balsam fir stand near Crescent Lake, Roberts Arm. A general outline of the area in which looper moths were observed was approximately 6 500 ha. Some defoliation is expected in this area in 1983.

Armillaria Root Rot, Armillaria mellea (Vahl. ex Fr.) Kummer – Several stands of black spruce in central and eastern Newfoundland have shown general deterioration and increased mortality of trees. Although these stands had been severely damaged for several years by the spruce budworm, they showed a good recovery during the past two years following the decline of budworm populations. Examination of many of the dying and dead trees have revealed the presence of A. mellea, the pathogen of the root rot, along with the four-eyed spruce bark beetle. Further investigations are needed to determine the role of the root rot and the bark beetle to induce such a heavy tree mortality in the apparently recovering stands.

Balsam Woolly Aphid, Adelges piceae (Ratz.) – Surveys to delineate the distribution of the aphid and to estimate population levels were conducted throughout the Island again in 1982. Highest numbers were found at Swift Current, Bunyan's Cove, Millertown Junction Road, Gander Bay South, South Brook Valley, Wild Cove (Bay of Islands), Humber Village and South Branch.

Table 2. Areas of moderate and severe defoliation, and moderate and high hazard forecast in productive forests of Newfoundland for 1983.

Management unit no.	Ownership	Moderate and severe defoliation (ha)	Moderate and high hazard (ha)
2	Crown	-	1183
7	Bowater	-	1659
8	Crown	-	1013
9	Bowater	-	1210
10	Abitibi	-	2214
11	Abitibi	-	5933
12	Abitibi	12858	12858
14	Crown	5282	28024
14	Bowater	36204	52504
15	Crown	-	272
15	Bowater	54474	54407
18	Bowater	-	1904
19	Crown	1013	1149
TNNP		408	408
All	Crown	6295	31641
	Bowater	90678	111684
	Abitibi	12858	21005
	TNNP	408	408
Total Island		109226	164738
Total Labrador		1013	1149

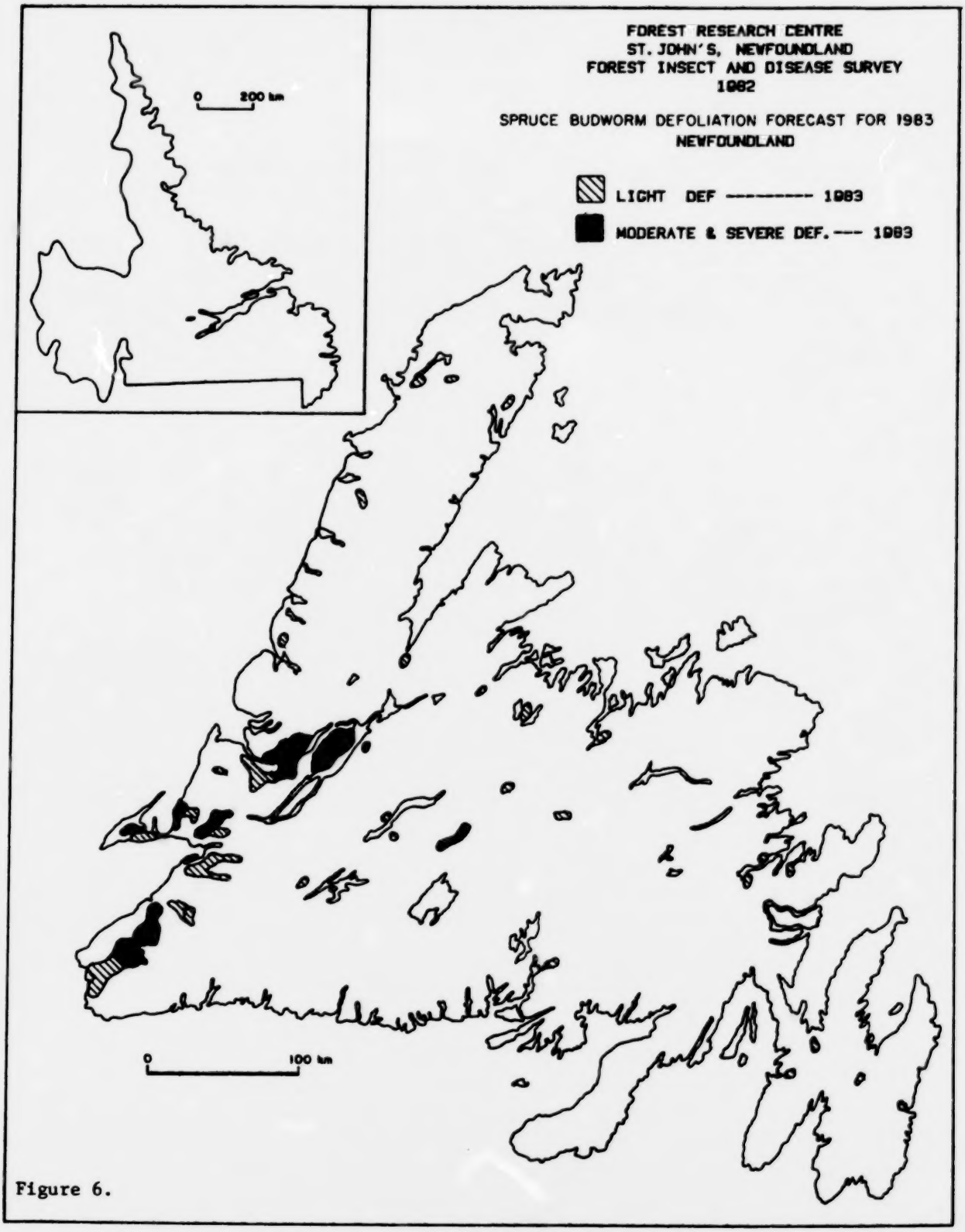
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1982
SPRUCE BUDWORM DEFOLIATION FORECAST FOR 1983
NEWFOUNDLAND
LIGHT DEF --------- 1983
MODERATE & SEVERE DEF. --- 1983
0 200 km
0 100 km

Figure 6.

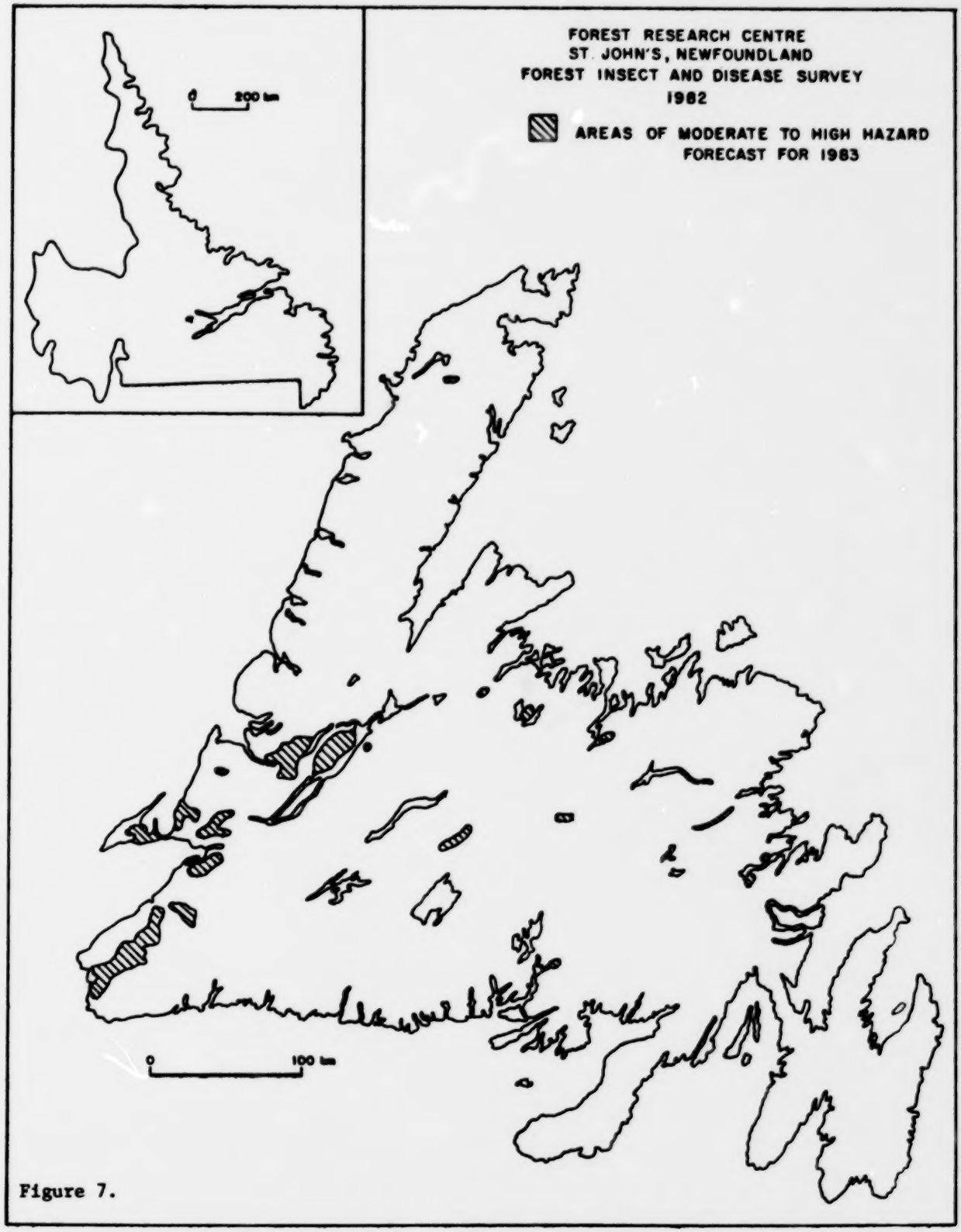
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1982
AREAS OF MODERATE TO HIGH HAZARD
FORECAST FOR 1983
0 200 km
0 100 km

Figure 7.

Table 3. Summary of spruce budworm eggmass numbers per 10 m2 of foliage for sample points with moderate and severe defoliation forecast in Newfoundland from 1978 to 1982.

	Moderate defoliation forecast*		Severe defoliation forecast*	
Year	No. sample points	Avg. EM/10 m^2	No. sample points	Avg. EM/10 m^2
1982	10	147	7	379
1981	4	129	4	440
1980	49	149	123	437
1979	65	149	149	438
1978	72	154	124	491

*Class limits for defoliation forecast based on egg-masses per 10 m^2 of foliage:

Defoliation forecast	
Nil	0%
Light	1% to 25%
Moderate	26% to 75%
Severe	76% to 100%

Inland Spruce Cone Rust of Black and White Spruces Caused by Chrysomyxa pirolata Wint. — The cone rust of black spruce continued its spread across the Island and was recorded from several more locations in western Newfoundland and on the Burin Peninsula. The incidence and intensity of the disease was low to moderate. On the Burin Peninsula the disease was severe and affected up to 95% of the cones and up to 80% of the trees.

The disease was also found for the first time on white spruce at a few locations on the Northern Peninsula and in western Newfoundland. It affected up to 90% of the cones and up to 90% of the trees.

Needle Rust of Conifers — Needle rust of black spruce, Chrysomyxa ledicola Lagerh. and C. empetri Schroet. was very common on the Island, but it was most damaging on the Avalon and Burin peninsulas. The incidence and intensity of the disease varied from low to high, affecting as much as 100% of the trees and over 90% of the foliage.

Needle rust of balsam fir, Pucciniastrum epilobii Otth. was moderate to severe in Goose Bay-Happy Valley area of Labrador. However, it was low to moderate on the Island and was most conspicuous in the eastern part of the Island.

Yellowheaded Spruce Sawfly, Pikonema alaskensis Roh. — Two infestations reported on black spruce regeneration along Great Rattling Brook and Pamehac Brook in 1981 were not inspected in 1982 due to the inaccessibility by vehicle. A survey of these areas will be conducted by helicopter in 1983.

Witches' Broom of Black Spruce, Arceuthobium pusillum Peck. — Witches' broom of black spruce, caused by eastern dwarf mistletoe, continued its spread. New infections, with low to high incidence, were observed at a few locations in central Newfoundland and on the Northern Peninsula. The most conspicuous infection patch, containing about 1000 trees, was found outside Gambo near the Trans Canada Highway. The infection was moderate to severe with as many as 9 brooms per tree.

Winter Drying — Damage by winter drying occurred in about 1 000 ha extending from Lomond to Norris Point in Gros Morne National Park. Stands covering about 850 ha of this area on the downward slope towards the ocean were severely damaged. Widespread drying of balsam fir and

black spruce regeneration affecting 75% to 90% of trees occurred in the Sunday Lake area on the Bay d'Espoir Road. Small pockets of similar damage were also observed along West Lake and Twin Lake roads. Winter drying of Scots pine was conspicuous on the Avalon and Burin peninsulas and affected up to 70% of the foliage and up to 75% of the trees at some locations. It was the most common non-infectious damage affecting pines.

Shoot Blight of Black Spruce Seedlings, Sirococcus strobilinus Preuss – The Sirococcus shoot blight was observed on black spruce seedlings in the Wooddale nursery near Grand Falls. This is the first record of this disease in Newfoundland. The incidence and severity of the disease was a trace to low and only in a few seedling beds. Sanitation and application of fungicides were recommended to control the disease.

Blackheaded Budworm, Acleris variana (Fern.) – Population levels of this budworm have increased during the past two years in the western and central areas of the Island with low numbers collected from the Codroy Valley to Glenwood. However, the severe infestation that occurred between Round Pond and St. Julien's on the Northern Peninsula has collapsed.

European Spruce Sawfly, Gilpinia hercyniae Htg. – High numbers of this sawfly were collected throughout central Newfoundland from Indian River to Glenwood. However, no larvae were collected between St. Georges and Deer Lake where a population increase was detected in 1981. Population levels of this insect fluctuate from year to year because of a virus disease that attacks it.

Spruce Beetle, Dendroctonus rufipennis Kby. – This beetle continued to cause tree mortality of white spruce along the Trans Canada Highway near Pasadena, along Bay of Islands between Summerside and McIvers and in new infestations between Brians Pond and Flat Pond on the Northern Peninsula and at the west end of Grand Falls.

PINE AND LARCH PESTS

Scleroderris Canker of Pines, Gremmeniella abietina (Lagerb.) Morelet – In 1982, the Forest Insect and Disease Survey organized an Island-wide survey in cooperation with all forest agencies and the Plant Quarantine Division of Agriculture Canada to define the distribution of this pest on the Island. The survey included all major urban areas and communities,

all natural stands of red pine, and plantations of various pine species. The European race of the disease has been found at 18 new locations in and around St. John's, Goulds, Mount Pearl, and in the Salmonier Valley. The latter location is the first record of this disease outside the vicinity of St. John's and outside the quarantine area established by the Provincial Department of Forest Resources and Lands in 1981. The disease in the Salmonier Valley affected ornamental trees of red, Scots and jack pines planted on the grounds of three summer cabins. The Plant Quarantine Division of Agriculture Canada requested the owners of infected trees to prune or remove and burn the diseased trees. The cutting and burning of trees in the plantation near Torbay was also completed.

Larch Sawfly, Pristiphora erichsonii (Htg.) — The infestation of this sawfly reported in tamarack stands between Codroy Valley and St. Georges for the past four years has terminated. However, the infestation between Deer Lake and Kittys Brook has expanded to Springdale and south to coalesce with the infestation along the south side of Red Indian Lake. Population levels near Miguels Brook on the Bay d'Espoir Road and near Cochrane Pond on the Avalon Peninsula were low.

Outbreaks of this sawfly usually last about 8 years. However, since the Island-wide dispersal of the introduced masked shrew, Sorex cinereus cinereus Kerr., sawfly outbreaks have had a duration of 4 years or less. In the shrew study plot at St. Georges, about 90 shrews were captured in 1980 and 1981 with a moderate to high sawfly infestation. However, in 1982, after the collapse of the sawfly, approximately 37 shrews were trapped showing the value of the masked shrew as an important predator.

Larch Beetle, Dendroctonus simplex Lec. — Population levels of the beetle decline along the Trans Canada Highway and secondary roads throughout central and eastern Newfoundland. Trees became more vigorous with the collapse of the spruce budworm and beetle damage was reduced. However, the infestation on the Avalon Peninsula increased as new areas west of Paddy's Pond became infested.

Eyespotted Budmoth, Spilonota ocellana (D. & S.) — This insect was collected for the first time on the Island in 1982. Several specimens were found on larch at Gushue's Pond Provincial Park and at Avondale Junction and the Trans Canada Highway. This insect is not considered to be a serious pest of larch trees.

Canker of Tamarack — A branch canker of tamarack was observed at a few locations on the Avalon and Burin peninsulas. The incidence of the disease was a trace, involving one to two branches per tree at a location. The identity of the pathogen is not yet complete.

DECIDUOUS TREE PESTS

Birch Casebearer, Coleophora serratella (L.) — Population levels remained low throughout western and central Newfoundland except for a small area near Sheffield Lake where moderate damage of white birch was recorded. In eastern Newfoundland the infestation reported in 1981 between Port Blandford and including the Avalon Peninsula has been reduced to only a few areas near St. John's and along the Conception Bay South Highway from Brigus to Paradise.

Foliage Diseases of Hardwoods — Scattered patches, with low to moderate incidence, of purple eye spot and anthracnose of red and mountain maples were conspicuous in central Newfoundland. Tar spot of willows was common in scattered patches throughout the Island, but it was severe at several locations on the Burin and Northern peninsulas.

Leaf blisters of white and yellow birches and of lombardy poplar were unusually conspicuous at some locations in western Newfoundland and in St. John's; their incidence varying from low to moderate.

Shoot and Leaf Blight of Trembling Aspen, Venturia macularis (Fr.) E. Muell & von Arx — This disease was extremely common in several stands of aspen regeneration in central Newfoundland and Goose Bay area in Labrador, but the infection was generally light. The disease also caused some damage to ornamental silver and balsam poplars in St. John's and Gander.

Mountain-ash Sawfly, Pristiphora geniculata (Htg.) — Moderate defoliation by this insect was recorded in St. John's. No recoveries of the introduced parasite, Olesicampe geniculatae Quednau & Lim (= Olesicampe sp. No. 5) were made in 1982. More parasites will be released in 1983 at Oxen Pond Botanic Park.

Gypsy Moth and Forest Tent Caterpillar, Lymantria dispar (Linn.) and Malacosoma disstria Hbn. — These destructive forest insects do not occur in Newfoundland but their accidental introduction is a distinct possibility. In 1982, pheromone traps were set out in cooperation with Agriculture Canada to monitor any introduction. Traps were located in

camping parks and near major towns. Results of this survey showed no gypsy moth adults captured but numerous forest tent caterpillar moths were caught. All moths trapped were males and no danger of an infestation is expected. Male moths are sometimes transported by air current while female moths cannot fly and the most likely method of dispersal to the Island is by recreational vehicles or equipment.

OTHER INSECTS AND DISEASES

Insect or disease	Host(s)	Locality	Remarks
Adelges cooleyi (Gill.) Cooley spruce gall adelgid	White spruce	Carbonear Southwest Brook Road	Light damage of regeneration
Altica ambiens Alni Harr. Alder flea beetle	Willow	Labrador	This beetle was common along Grand Lake Road but caused only light damage
Animal damage	Jack pine Balsam fir Black spruce	Gambo Millertown T.N.N.P.	Squirrels caused flagging when removing cones
Apiosporina morbosa (Schw.) Arx Black knot	Pin cherry	Throughout Island and eastern Labrador	Most conspicuous in 1982
Chrysomyxa arctostaphli Diet. Broom rust	Black spruce	Throughout Island and eastern Labrador	Low incidence
Chrysomela falsa Brown Willow leaf beetle	Willow Trembling aspen	Baie Verte and eastern Labrador	Moderate defoliation in both areas
Chrysomela mainensis mainensis Bech. Alder leaf beetle	Alder	North Branch River Deer Lake	Light defoliation
Ciborinia whetzelii (Seav.) Seav. Ink spot	Trembling aspen	Throughout Island and eastern Labrador	Moderate and severe defoliation
Croesus latitarsus Nort. Dusky birch sawfly	White birch	St. John's	Severe defoliation
Dasineura balsamicola (Linn.) False balsam gall midge	Balsam fir	Eastern Labrador	Several trees infested

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OTHER INSECTS AND DISEASES - Concluded

Insect or disease	Host(s)	Locality	Remarks
Dothistroma pini Hulbary Red banded needle blight	Red pine Scots pine	Glovertown Salmonier Line	High incidence
Fenusa dohrnii (Tischb.) European alder leafminer	Alder	Throughout Island and eastern Labrador	Low populations
Fenusa pusilla (Lep.) Birch leafminer	White birch Mountain birch	Avalon Peninsula Western Nfld.	Low populsations
Frost damage	Balsam fir Black spruce	Throughout Island	Low to high incidence
Isthmiella faullii (Darker) Darker Needle cast	Balsam fir	Goose Bay	Moderate incidence
Leucoma salicis (Linn.) Satin moth	Willow Balsam poplar	Pasadena Corner Brook	Low populations Light damage
Lophodermium pinastri (Schrad. ex Hook.) Chev. Needle cast	Jack pine Scots pine	Eastern Nfld.	Moderate and high incidence
Mindarus abietinus Koch Balsam twig aphid	Balsam fir	Throughout Island	Moderate and high population levels